SWRCB Salmonids and Pelagic Organisms workshop

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Outline

- What additional scientific information should be considered to inform potential changes to the Bay-Delta plan?

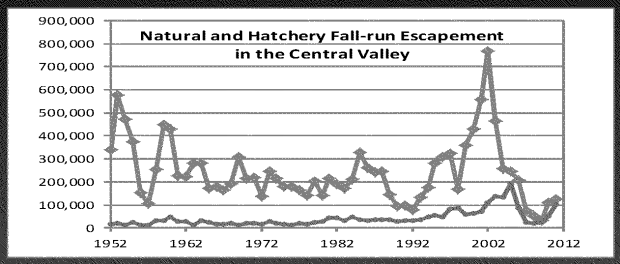
- How should the State Board address scientific uncertainty and changing circumstances?

* Key Points from previous submittals

The Board should consider UPDATED, RECENT and past information on:

1. the status of the stocks
2. juvenile abundance indices at Chipps Island relative to flow
3. genetic information at Sacramento, Chipps Island and at the fish facilities
4. survival information from the San Joaquin Delta/Basin - including HORB and importance of continued survival monitoring
5. and increasing DCC gate closures

1. The status of the stocks



Indicators demonstrate

- continued decline of salmonid populations

- more protection is needed to meet WQCP's narrative salmon doubling goal

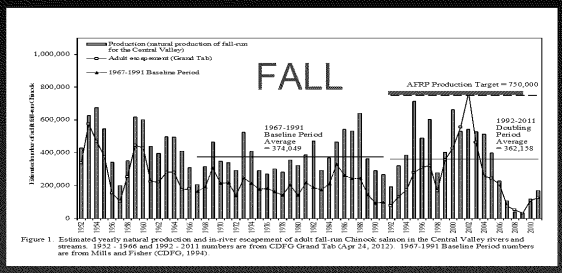


Figure 1. Estimated yearly natural production and in-river escapement of adult fall-run Chinook salmon in the Central Valley rivers and streams. 1952 - 1966 and 1992 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

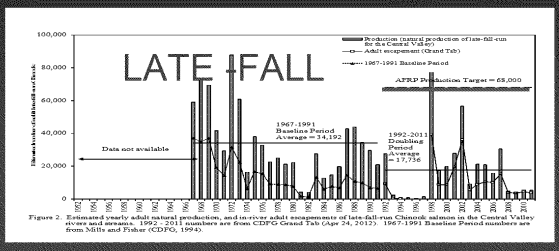


Figure 2. Estimated yearly adult natural production, and in-river adult escapements of late-fall-run Chinook salmon in the Central Valley rivers and streams. 1952 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

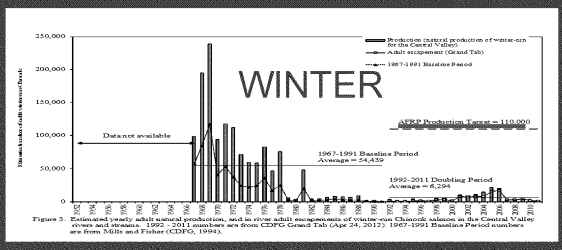


Figure 3. Estimated yearly adult natural production, and in-river adult escapements of winter-run Chinook salmon in the Central Valley rivers and streams. 1952 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

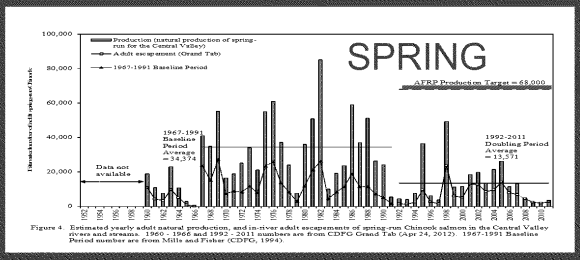
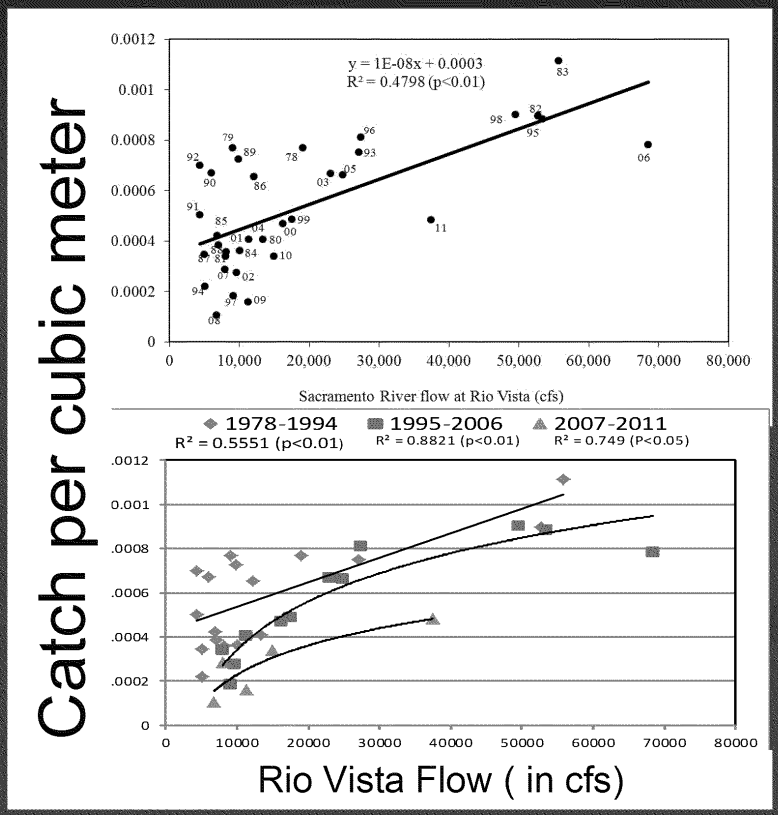


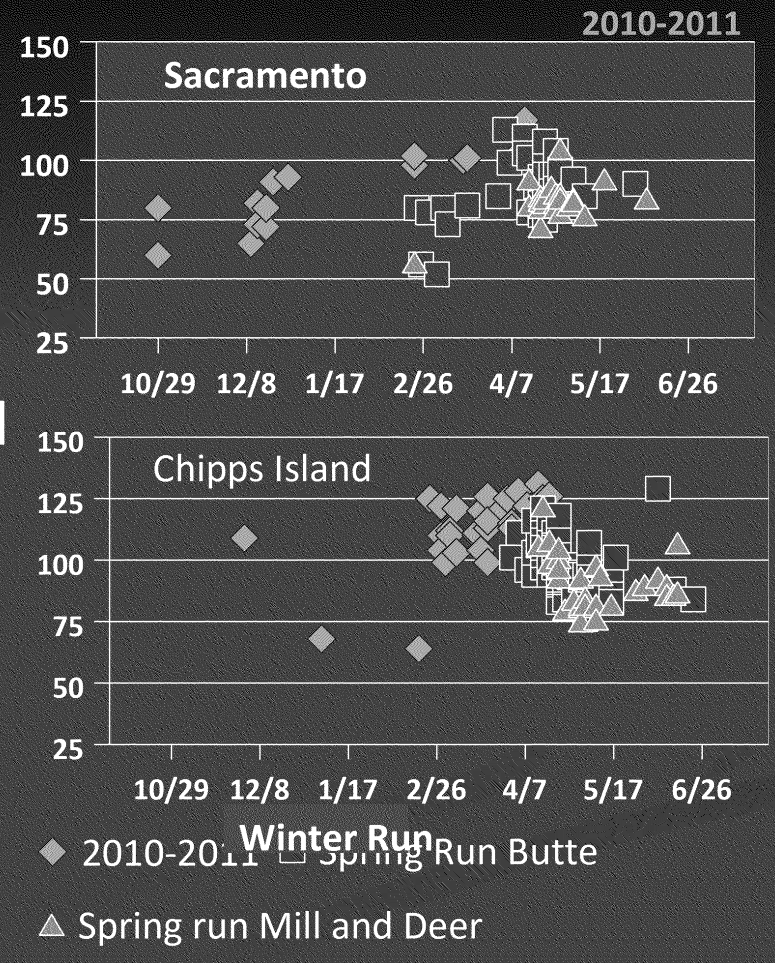
Figure 4. Estimated yearly adult natural production, and in-river adult escapements of spring-run Chinook salmon in the Central Valley rivers and streams. 1960 - 1966 and 1992 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period number are from Mills and Fisher (CDFG, 1994).

2. Juvenile salmon abundance indices at Chipps Island relative to flow

Juvenile salmon abundance leaving the Delta is still higher at higher flows



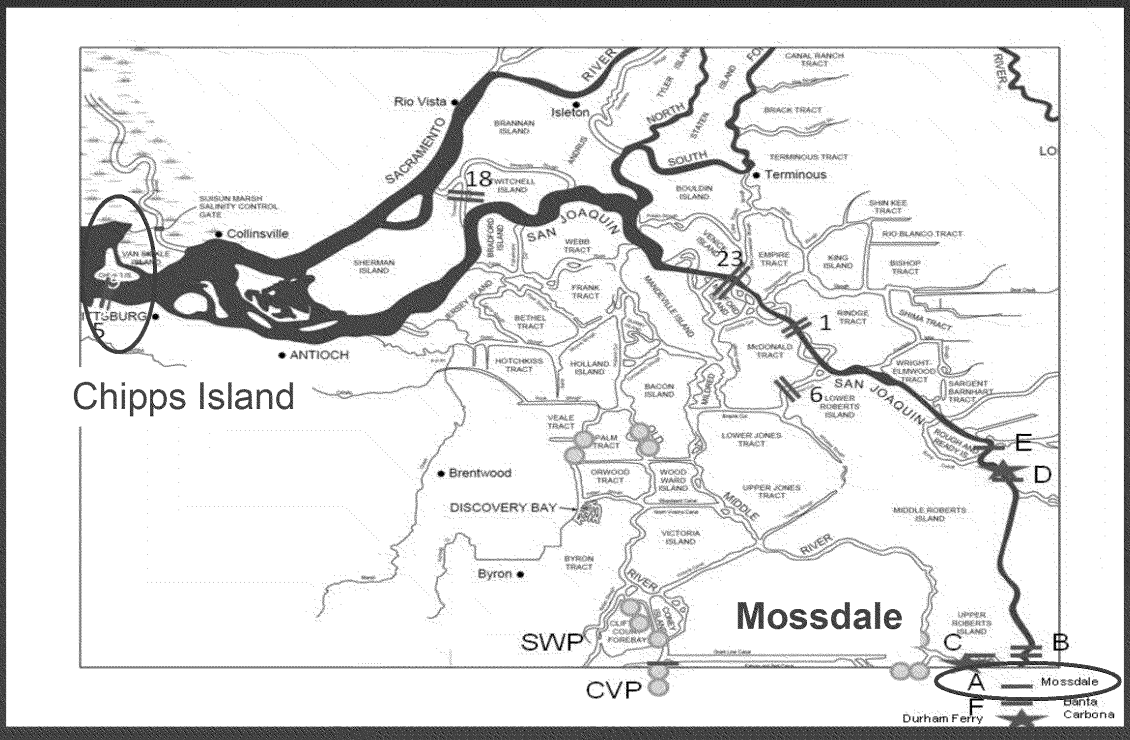
3. the temporal distribution of winter and spring- run Chinook salmon in the Delta based on genetic analyses.



Source: FWS preliminary, unpublished data

4. juvenile salmon survival estimates from the 2010 VAMP

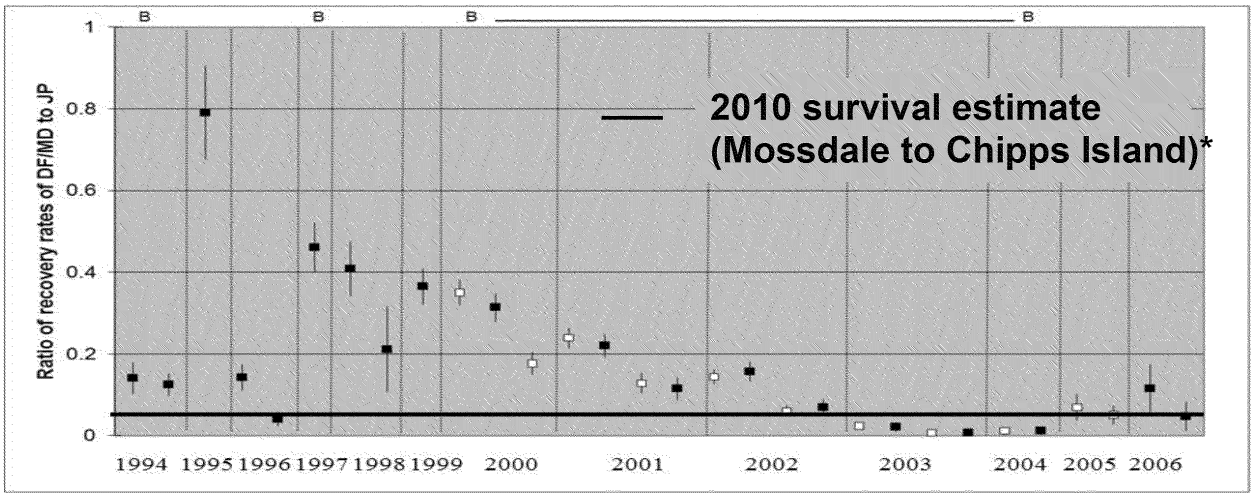
(and other recent survival studies)



Juvenile salmon survival was low (0.05) in 2010

relative to mean of past estimates ($\bar{X}$ = 0.16)

Salmon smolt survival from Mossdale (black) or Durham Ferry (white) to Jersey Point



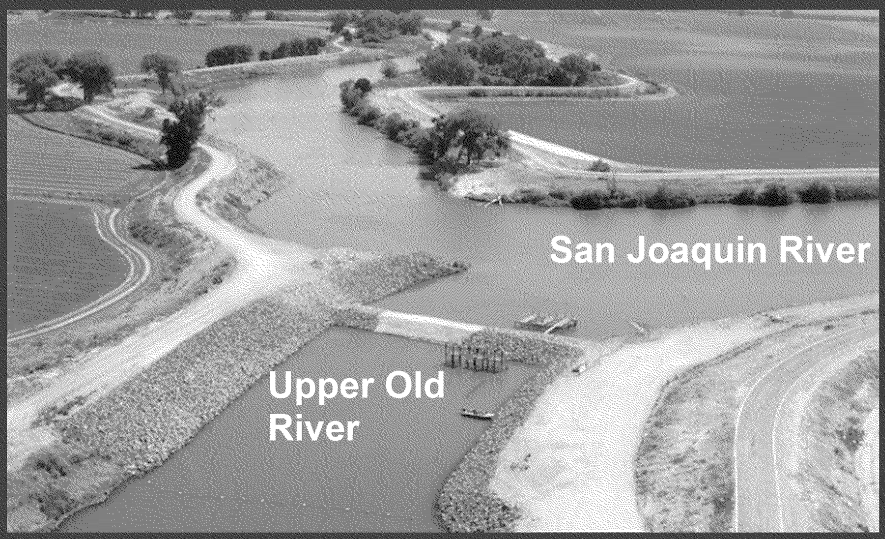
*Additional mortality between Jersey Point and Chipps Island is assumed to be low.

B = Years with physical Head of Old River installed
Non-physical barrier installed in 2010.

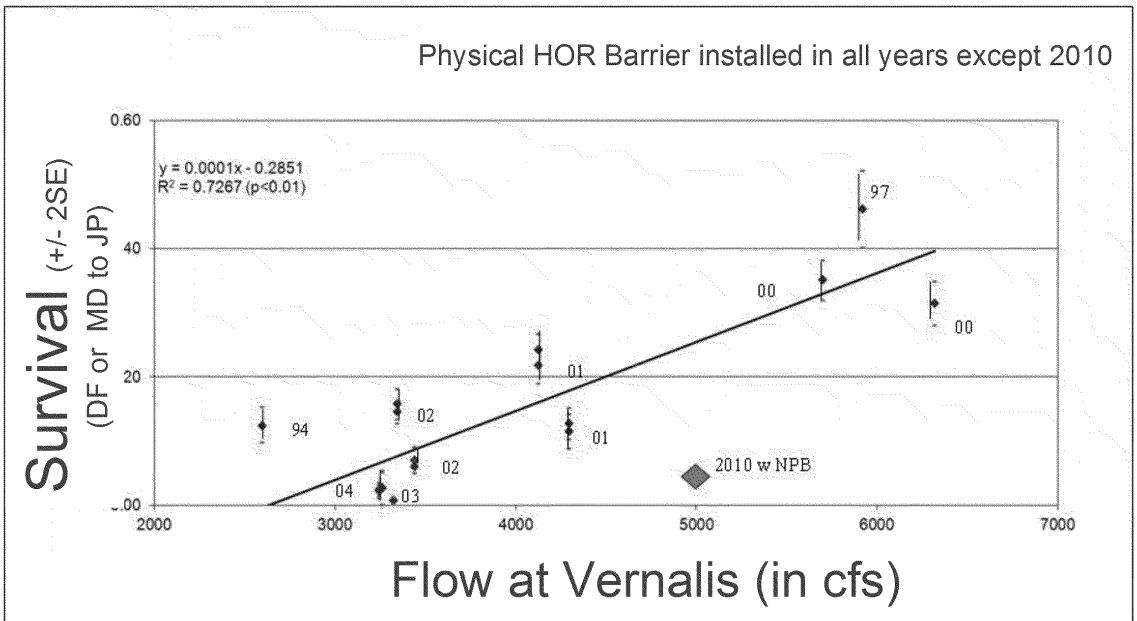
Source Brandes et al., 2008. and SJRG, 2010

The Board should also consider information on:

the benefits to salmon of a physical barrier at the head of Old River – while still being protective of delta smelt

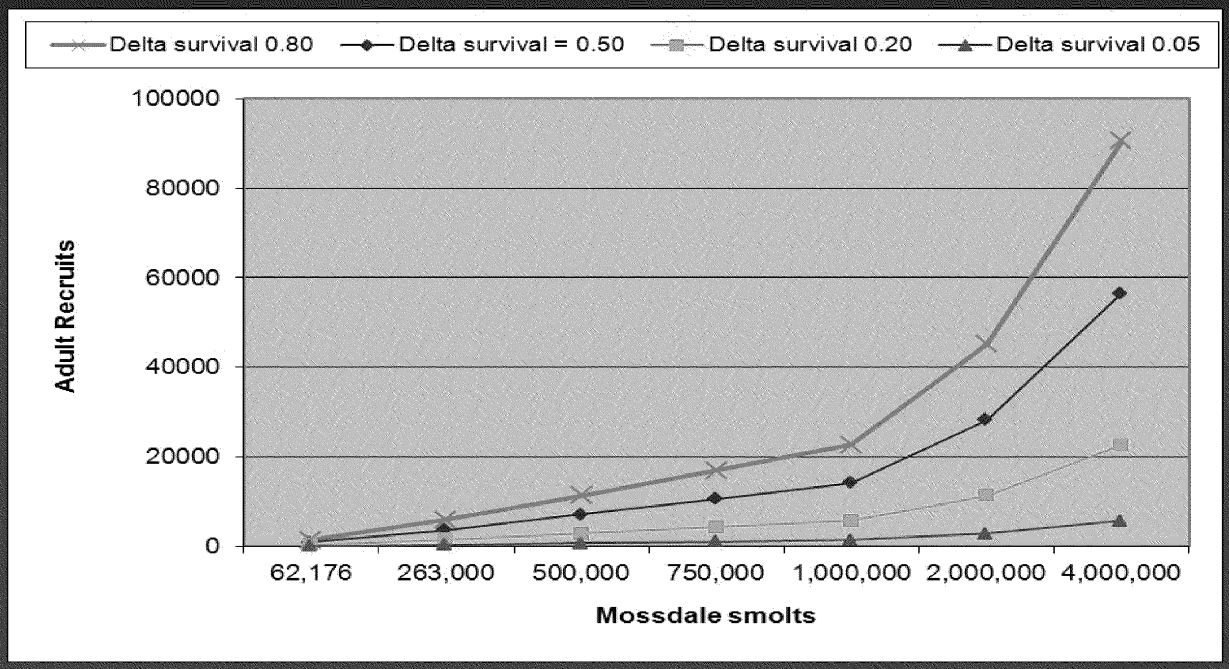


Salmon survival with a physical HORB is related to flow and higher than with the non-physical barrier in 2010



Source: SJRG, 2007 and SJRG, 2011

Adult recruitment is very sensitive to juvenile survival in simulations



* Simulations also indicate a 0.50 survival rate through the Delta could meet the doubling goal in the San Joaquin basin in 27 years.

Source: DOI, 2011

*

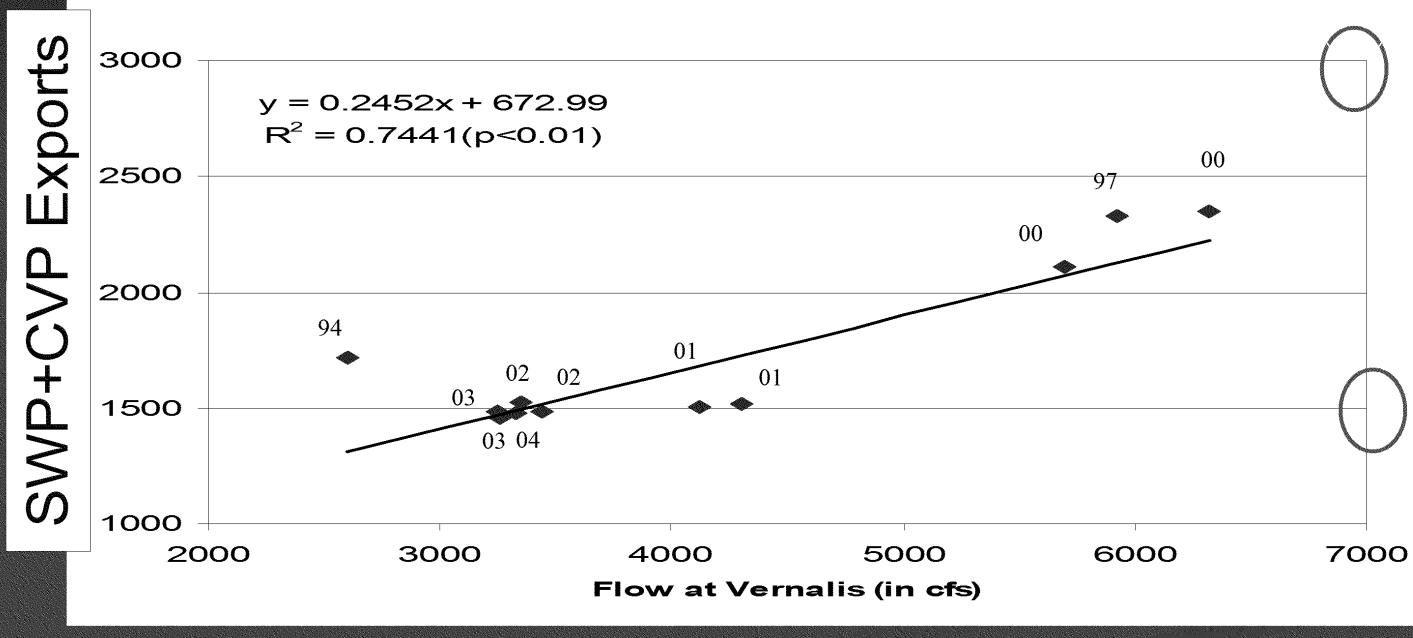
The Board should also consider:

the importance of continued survival monitoring: upstream and in the Delta

- No consistent survival monitoring occurring in Sacramento River through the Delta or upstream

- VAMP monitoring is no longer occurring (need additional data to assess export mortality on survival)

The relationship between flow and exports during VAMP tests with the physical HORB in place



The Board should also consider new and previous information on:

5. Increasing the frequency and duration of DCC gate closures
   *(and flow conditions that achieve no bidirectional flow to minimize the proportion of juvenile salmon entering Georgiana Slough)

(DOI, 2010 and DOI,2012)

The Board should address scientific uncertainty and changing circumstances

- With an adaptive management plan (AMP) but consider a more protective approach while AMP development proceeds.

* Although there is uncertainty, there is evidence that increased flows will benefit native fishes, including salmonids (DOI, 2010).

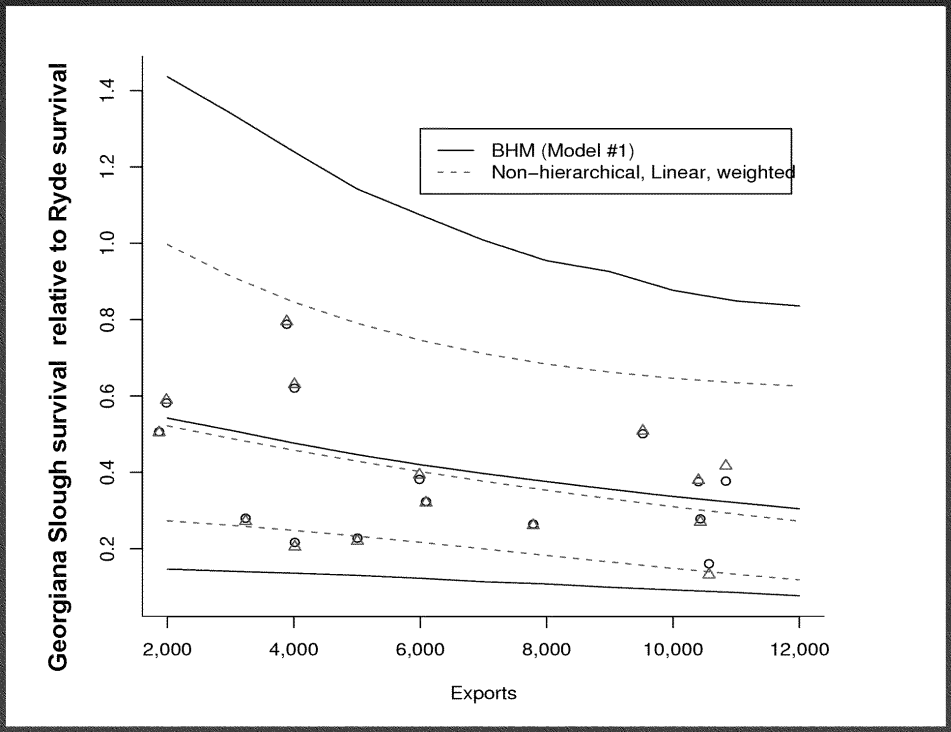
and evidence suggests that exports may decrease salmon survival in the interior Delta

Uncertainty associated with

-Low sample size (15) – need 100

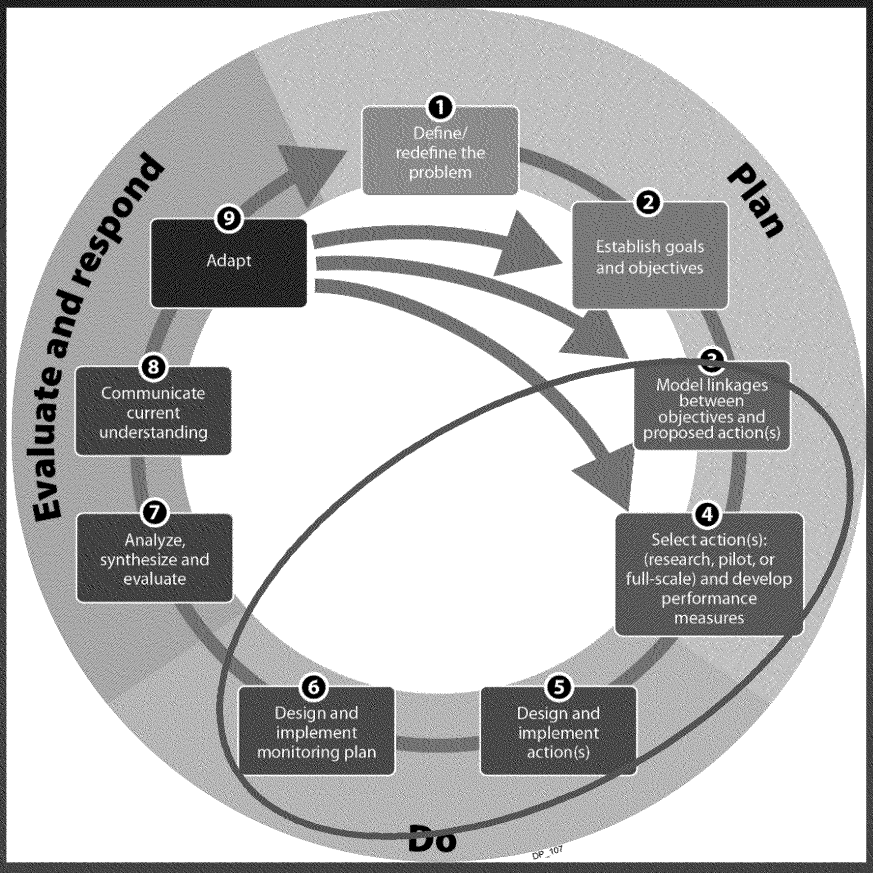
-Lots of noise relative to the signal

Proportion entering interior Delta estimated by Perry (2010) - a function of flow entering GS



Source : Newman and Brandes, 2010

Adaptive Management



Needs:
Specific biological and physical indicators

A range of flow criteria alternatives

DOI Technical and Application Guides may be helpful

Source: Delta Stewardship Council. 2012. Final Staff Draft of the Delta Plan. Available online: http://deltacouncil.ca.gov/delta-plan. Accessed 8/10/12.

Key Points from Previous submittals

* Flow is one of the most important components of ecosystem function (DOI, 2012).
* Changes in Delta flows and flow variability have contributed to declines of multiple native species, including salmonids (DOI, 2010)
* Delta inflow and outflow are important for salmon migration cues, and juvenile survival and abundance (DOI, 2010)

Key Points from Previous submittals

* Multiple mechanisms are hypothesized for increased survival at higher flows:

  - reduced water temperatures,
  - lower proportion of flow diverted,
  - reduced entrainment,
  - lower predation and disease,
  - elimination of reverse flows,
  - increased floodplain habitat

DOI (2010)

Key points from previous submittals

* The Board should consider flow objectives based upon a similar percent of unimpaired flow from each of the San Joaquin tributaries to meet the Vernalis objective. (DOI, 2011)

*Increased flows that mimic the general seasonality, variability, magnitude and duration of the natural hydrograph will benefit native fishes including salmonids. (DOI, 2011)